

CLAIMS

What is claimed is:

1. A water control fixture, comprising:

an operating valve in said water control fixture for controlling the flow of
5 water from a pressurized supply of hot water; and

a thermostatically controlled bypass valve disposed in said water control
fixture, said bypass valve having a thermally sensitive actuating element therein
configured to bypass water from said supply of hot water to a supply of cold water until
the temperature of the water is at a preset level.

10 2. The water control fixture according to claim 1, wherein said actuating
element comprises an actuating body and a rod member, said rod member configured
to operatively extend from said actuating body and seal said bypass valve.

3. The water control fixture according to claim 2, wherein said rod
member has a reduced diameter section to allow for lime buildup.

15 4. The water control fixture according to claim 2 further comprising a
sharp cornered guide bore on said actuating body.

5. The water control fixture according to claim 4, wherein said rod
member has a reduced diameter section to allow for lime buildup.

20 6. The water control fixture according to claim 1, wherein said actuating
element is a wax-filled cartridge actuator.

7. The water control fixture according to claim 1, wherein said actuating element is insulated.

8. The water control fixture according to claim 1 further comprising a screen disposed in a hot water inlet of said water control fixture.

5 9. The water control fixture according to claim 1 further comprising a bias spring disposed in said ^{APA}bypass valve between said valve seat and said actuating body to urge said rod member toward said actuating body to open said valve seat.

10 10. The water control fixture according to claim 1 further comprising a ⁴⁷check valve disposed in said bypass valve.

11. The water control fixture according to claim 1 further comprising a housing with an interior chamber disposed in said housing, said interior chamber hydraulically connected to said supply of hot water, said bypass valve disposed in said interior chamber.

12. The water control fixture according to claim 11, wherein said bypass valve is disposed in a cartridge configured to fit within said interior chamber.

13. The water control fixture according to claim 11, wherein said bypass valve is removably disposed in said interior chamber.

14. The water control fixture according to claim 13, wherein said bypass valve is removable through the top of said water control fixture.

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15. The water control fixture according to claim 11, wherein said housing interconnects said supply of hot water and said supply of cold water.

16. The water control fixture according to claim 15, wherein said housing further comprises a hot water cross passage interconnecting said interior chamber with hot water conduit located in said housing, said hot water conduit connected to said supply of hot water.

17. The water control fixture according to claim 16, wherein said housing further comprises a cold water cross passage interconnecting said interior chamber with a cold water conduit located in said housing, said cold water conduit connected to said supply of cold water.

18. The water control fixture according to claim 17, wherein said interior chamber interconnects said hot water cross passage and said cold water cross passage, said bypass valve configured to bypass water from said hot water cross passage to said cold water cross passage.

19. The water control fixture according to claim 11, wherein said housing has a hot water channel interconnecting said supply of hot water with said interior chamber and a cold water channel interconnecting said interior chamber with said supply of cold water, said bypass valve configured to bypass water from said hot water channel to said cold water channel.

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20. The water control fixture according to claim 11, wherein said housing is disposed at the rear of said fixture.

21. The water control fixture according to claim 11, wherein housing is a threaded pipe integral with said fixture.

22. The water control fixture according to claim 11, wherein said housing is adapted for use as a dual handle, single spout water control fixture by adding a side port for the discharge of water from said fixture.

23. The water control fixture according to claim 1, wherein said bypass valve is disposed in said operating valve.

24. The water control fixture according to claim 23, wherein said operating valve comprises a moveable valving ball having one or more inlet ports thereon for selective communication with said supply of hot water and said supply of cold water.

25. The water control fixture according to claim 24, wherein said ball has an annular compartment and an inner compartment in the interior of said ball.

26. The water control fixture according to claim 25, wherein said actuating element is disposed in said inner compartment and said annular compartment is in fluid communication with said one or more inlet ports on said ball.

27. The water control fixture according to claim 26 further comprising one or more bypass ports on said ball, said bypass ports in fluid communication with

said inner compartment to allow said bypass valve to bypass fluid from said supply of hot water to said supply of cold water.

28. The water control fixture according to claim 23, wherein said operating valve comprises a replaceable cylindrical valving cartridge having a moveable valving spool.

29. The water control fixture according to claim 28, wherein said actuating element is disposed in said moveable valving spool.

30. The water control fixture according to claim 29, wherein said actuating element has a shuttle connected to a piston actuated by an actuator.

31. The water control fixture according to claim 30, wherein said shuttle has an integral elastomer sleeve.

32. A water control fixture, comprising:
an operating valve in said water control fixture for controlling the flow of water from a pressurized supply of hot water; and

a thermostatically controlled bypass valve disposed in said water control fixture, said bypass valve having a thermally sensitive actuating element therein configured to bypass water from said supply of hot water to a supply of cold water until the temperature of the water is at a preset level, said actuating element configured to operatively seal said bypass valve.

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33. The water control fixture according to claim 32 further comprising a housing with an interior chamber disposed in said housing, said interior chamber hydraulically connected to said supply of hot water, said bypass valve disposed in said interior chamber.

5 34. The water control fixture according to claim 33, wherein said bypass valve is disposed in a cartridge configured to fit within said interior chamber.

35. The water control fixture according to claim 33, wherein said bypass valve is removably disposed in said interior chamber.

10 36. The water control fixture according to claim 35, wherein said bypass valve is removable through the top of said water control fixture.

15 37. The water control fixture according to claim 33, wherein said housing has a hot water channel interconnecting said supply of hot water with said interior chamber and a cold water channel interconnecting said interior chamber with said supply of cold water, said bypass valve configured to bypass water from said hot water channel to said cold water channel.

38. The water control fixture according to claim 32, wherein said bypass valve is disposed in said operating valve.

20 39. The water control fixture according to claim 38, wherein said operating valve comprises a moveable valving ball having one or more inlet ports thereon for selective communication with said supply of hot water and said supply of

cold water, said ball having an annular compartment and an inner compartment in the interior of said ball.

40. The water control fixture according to claim 39, wherein said actuating element is disposed in said inner compartment and said annular compartment is in fluid communication with said one or more inlet ports on said ball.

41. The water control fixture according to claim 40 further comprising one or more bypass ports on said ball, said bypass ports in fluid communication with said inner compartment to allow said bypass valve to bypass fluid from said supply of hot water to said supply of cold water.

42. The water control fixture according to claim 38, wherein said operating valve comprises a replaceable cylindrical valving cartridge having a moveable valving spool, said actuating element disposed in said moveable valving spool.

43. The water control fixture according to claim 42, wherein said actuating element has a shuttle connected to a piston actuated by an actuator and said shuttle has an integral elastomer sleeve.

44. A water circulating system for distributing water, comprising:
a water control fixture having an operating valve configured for utilizing hot and cold water, said fixture having a hot water inlet and a cold water inlet;
a hot water heater for supplying hot water to said fixture;

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a hot water line interconnecting said hot water heater with said
hot water inlet at said fixture;

a pump in said hot water line for pressurizing said hot water line;

a source of cold water for supplying cold water to said fixture;

5 a cold water line interconnecting said source of cold water with said cold
water inlet at said fixture; and

10 a thermostatically controlled bypass valve disposed in said fixture, said
bypass valve configured to bypass water from said hot water line to said cold water line
until the water in said hot water line at said water control valve reaches a preset
temperature value, said bypass valve comprising a thermally sensitive actuating
element having an actuating body and a rod member.

15 45. The water circulating system according to claim 44, wherein said
water control fixture further comprises a housing with an interior chamber disposed in
said housing, said interior chamber hydraulically connected to said hot water line, said
bypass valve disposed in said interior chamber.

46. The water circulating system according to claim 45, wherein said
bypass valve is disposed in a cartridge configured to fit within said interior chamber.

47. The water circulating system according to claim 45, wherein said
bypass valve is removably disposed in said interior chamber.

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48. The water circulating system according to claim 45, wherein said bypass valve is removable through the top of said water control fixture.

49. The water circulating system according to claim 44, wherein said bypass valve is disposed in said operating valve.

50. The water circulating system according to claim 49, wherein said operating valve comprises a moveable valving ball having one or more inlet ports thereon for selective communication with said hot water line and said cold water line, said ball having an annular compartment and an inner compartment in the interior of said ball, said actuating element disposed in said inner compartment, said annular compartment in fluid communication with said one or more inlet ports, said ball having one or more bypass ports on said ball in fluid communication with said inner compartment to allow said bypass valve to bypass fluid from said hot water line to said cold water line.

51. The water circulating system according to claim 49, wherein said operating valve comprises a replaceable cylindrical valving cartridge having a moveable valving spool, said actuating element disposed in said moveable valving spool.

52. The water circulating system according to claim 51, wherein said actuating element has a shuttle connected to a piston actuated by an actuator, said shuttle having an integral elastomer sleeve.

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53. The water circulating system according to claim 44, wherein said pump is a low flow and low head pump.

54. The water circulating system according to claim 44 further comprising a pump check valve configured to pass water around said pump when the flow rate in said hot water piping system exceeds the flow rate capacity of said pump.

55. The water circulating system according to claim 44 further comprising means for cyclically operating said pump.

56. The water circulating system according to claim 55 further comprising a flow switch for detecting the flow of water in said hot water piping system, said flow switch operatively connected to said pump and suitable for shutting off said pump when the flow of water in said hot water piping system exceeds the flow rate capacity of said bypass valve.